

# **Exhibit 8**

IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF OHIO  
EASTERN DIVISION

IN RE NATIONAL  
PRESCRIPTION OPIATE  
LITIGATION

: MDL No. 2804  
: CASE NO. 17-MD-2804  
: (DAP)  
:

EXPERT REPORT OF CRAIG J. MCCANN, PH.D., CFA  
March 25, 2019

## **IX. Transaction Analysis**

130. I implemented various approaches to identify transactions meeting specified criteria using the non-public ARCOS Data from 2006 to 2014, supplemented with Defendant transaction data where the ARCOS Data is obviously missing transactions that are included in the transactions produced by Defendants in discovery and to the extent I have Defendant transaction data for the periods before 2006 and after 2014. I calculated the results separately for each of twelve controlled substance drug codes.<sup>54</sup>

### **A. Maximum Monthly, Trailing Six-month Threshold**

131. Under the first approach, I identify transactions that cause the number of dosage units shipped by a Distributor to a Pharmacy in a calendar month to exceed the highest number of dosage units shipped by the Distributor to the Pharmacy in any one of the six preceding calendar months. For example, if the number of dosage units containing hydrocodone shipped from a Distributor to a Pharmacy in February, March, April, May, June, and July were 5,000; 10,000; 7,000; 8,000; 9,000; and 9,500 respectively, a requested transaction in August would be flagged if it would cause the number of dosage units containing hydrocodone the Distributor shipped to the Pharmacy to exceed 10,000. Any reported transactions containing hydrocodone on that date and all reported transactions containing hydrocodone from that Distributor to that Pharmacy thereafter are flagged.

132. In this approach and the others implemented below I have been asked by Counsel to assume that the Distributor did not effectively investigate

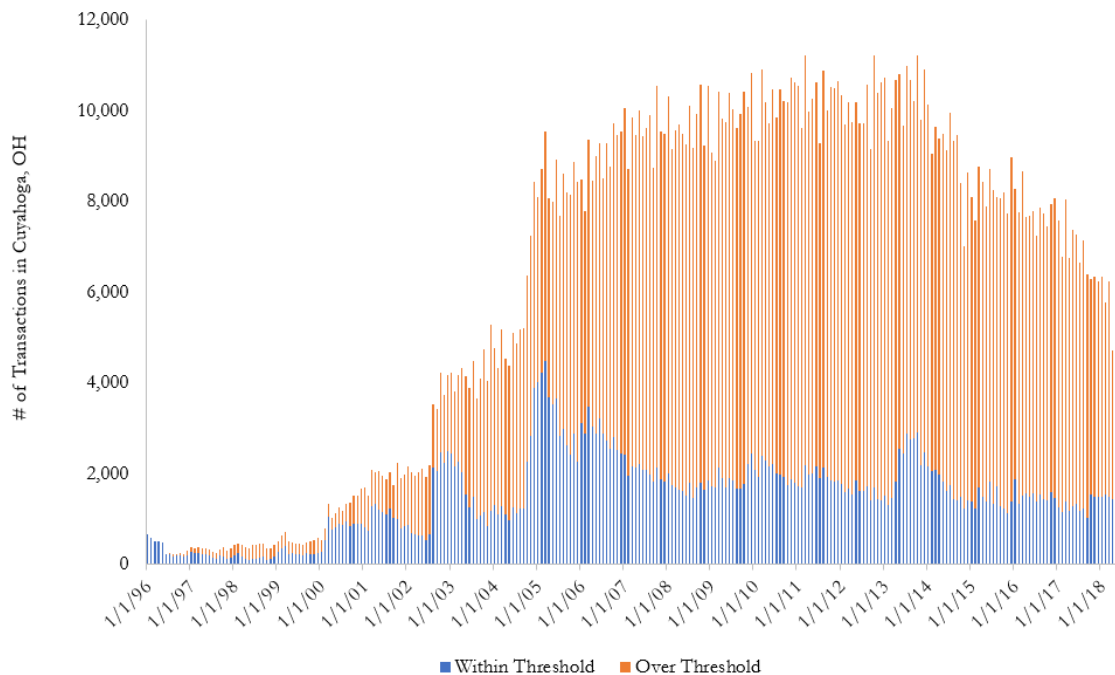
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<sup>54</sup> I do not analyze transactions in two treatment drugs: buprenorphine and methadone.

the flagged transactions and so every subsequent transaction of that drug code is also flagged because the Distributor had an unfulfilled obligation to detect and investigate the first flagged transaction.

133. Figure 11 illustrates total opioid transactions from Distributors to retail and chain pharmacies into Cuyahoga County from 1996 to 2018. The Trailing Six-Month Maximum Threshold methodology flags 76.0% of transactions accounting for 89.6% of dosage units, 73.5% of MME and 83.2% of drug weight shipped into Cuyahoga County. Additional charts and tables reflecting the result of applying this methodology and the methodologies below to each Distributor are in Appendix 10.

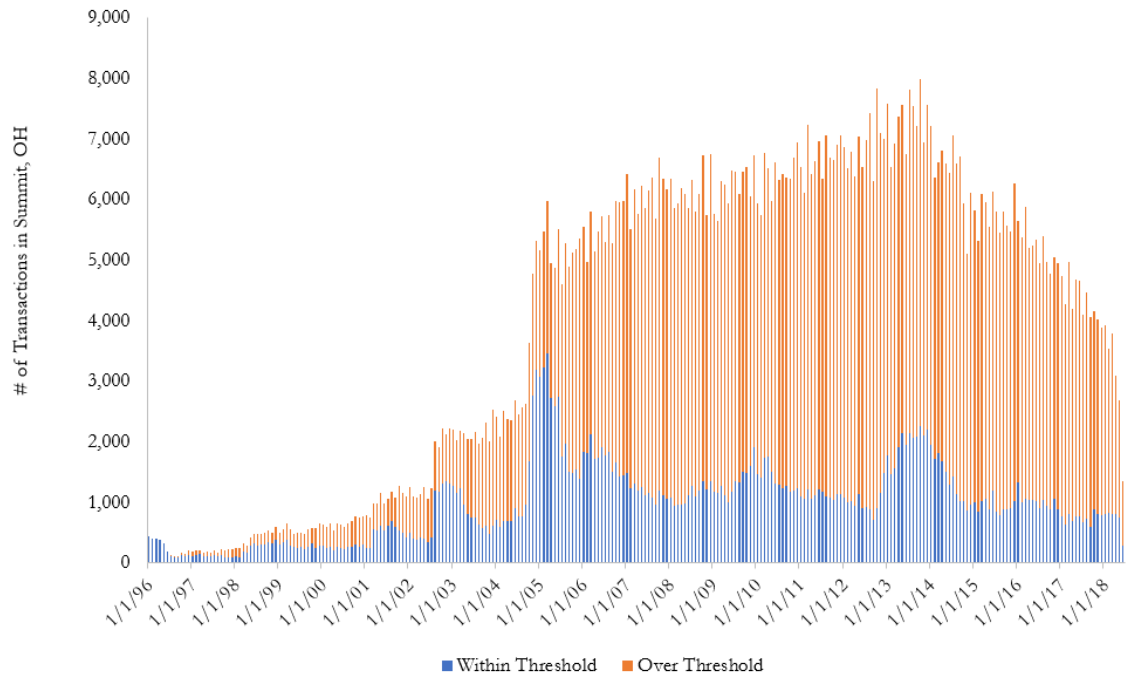
Figure 11 Trailing Six-Month Maximum Threshold Flagged Transactions, Cuyahoga County, OH 1996-2018



134. Figure 12 illustrates total transactions from Distributors to retail and chain pharmacies into Summit County from 1996 to 2018. The Trailing Six-Month Maximum Threshold methodology flags 75.4% of transactions

accounting for 88.5% of dosage units, 71.4% of MME and 83.1% of drug weight shipped into Summit County.

Figure 12 Trailing Six-Month Maximum Threshold Flagged Transactions, Summit County, OH, 1996-2018



135. Table 24 and Table 25 summarize the transactions in transactions flagged based on the Trailing Six-Month Maximum Threshold Approach in Cuyahoga and Summit Counties.

Table 24 Trailing Six-Month Maximum Threshold Flagged Transactions,  
Cuyahoga County, OH 1996-2018

# of Flagged Transactions	Oxycodone	Hydrocodone	Morphine	Hydromorphone	Oxymorphone	Other	Total
AmerisourceBergen	99,137	49,339	14,957	2,874	545	11,597	178,449
Anda, Inc	700	1,723	0	2	0	69	2,494
Cardinal Health	192,799	94,450	26,389	3,061	3,974	30,020	350,693
CVS	n/a	109,055	n/a	n/a	n/a	8,772	117,827
Discount Drug Mart	n/a	32,583	0	n/a	n/a	3,229	35,812
H. D. Smith	269	0	0	0	0	0	269
HBC Service Co	4,909	41,114	0	0	0	1,275	47,298
Henry Schein Inc	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McKesson Corp	129,021	89,263	9,185	759	538	6,265	235,031
Miami-Luken	0	0	0	0	n/a	0	0
Prescription Supply	5,008	489	1,220	134	0	40	6,891
Rite Aid	n/a	18,828	n/a	n/a	n/a	2,748	21,576
Walgreens	97,401	100,421	19,462	3,900	0	10,744	231,928
Wal-Mart	16,070	25,737	477	76	0	990	43,350
<b>Total</b>	<b>545,314</b>	<b>563,002</b>	<b>71,690</b>	<b>10,806</b>	<b>5,057</b>	<b>75,749</b>	<b>1,271,618</b>

Table 25 Trailing Six-Month Maximum Threshold Flagged Transactions, Summit County, OH 1996-2018

# of Flagged Transactions	Oxycodone	Hydrocodone	Morphine	Hydromorphone	Oxymorphone	Other	Total
AmerisourceBergen	77,175	52,681	21,289	6,341	2,830	10,804	171,120
Anda, Inc	690	1,302	121	2	0	188	2,303
Cardinal Health	111,200	50,300	24,731	5,707	2,638	13,065	207,641
CVS	n/a	45,927	n/a	n/a	n/a	2,624	48,551
Discount Drug Mart	n/a	8,500	0	n/a	n/a	720	9,220
H. D. Smith	60	125	0	n/a	0	0	185
HBC Service Co	2,682	26,651	0	0	0	703	30,036
Henry Schein Inc	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McKesson Corp	96,172	64,409	20,338	5,156	4,116	6,280	196,471
Miami-Luken	2,999	1,308	391	0	236	0	4,934
Prescription Supply	16	4	0	0	0	0	20
Rite Aid	n/a	10,953	n/a	n/a	n/a	898	11,851
Walgreens	39,284	47,489	11,596	3,050	0	2,669	104,088
Wal-Mart	9,010	15,052	777	173	0	393	25,405
<b>Total</b>	<b>339,288</b>	<b>324,701</b>	<b>79,243</b>	<b>20,429</b>	<b>9,820</b>	<b>38,344</b>	<b>811,825</b>

### B. Twice Trailing Twelve-Month Average Pharmacy Dosage Units

136. I identify transactions that cause the number of dosage units shipped by a Distributor to a Pharmacy in a calendar month to exceed twice the trailing twelve-month average dosage units to retail and chain pharmacies served by the Distributor. I have been asked by Counsel to assume that the Distributor did not effectively investigate the flagged transactions and so every subsequent transaction of that drug code is also flagged because the Distributor had an unfulfilled obligation to detect and investigate the first flagged transaction.

Table 27 Twice Trailing Twelve-Month Average Pharmacy Dosage Units Threshold Flagged Transactions, Summit County, OH 1996-2018

# of Flagged Transactions	Oxycodone	Hydrocodone	Morphine	Hydromorphone	Oxymorphone	Other	Total
AmerisourceBergen	41,408	48,241	17,443	6,140	3,737	22,741	139,710
Anda, Inc	1,081	1,245	221	22	0	325	2,894
Cardinal Health	84,118	48,828	27,703	7,966	4,458	35,525	208,598
CVS	n/a	27,081	n/a	n/a	n/a	1,443	28,524
Discount Drug Mart	n/a	7,405	0	n/a	n/a	533	7,938
H. D. Smith	0	105	0	n/a	0	23	128
HBC Service Co	2,025	16,692	200	28	22	491	19,458
Henry Schein Inc	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McKesson Corp	64,582	62,291	20,257	6,303	5,538	24,320	183,291
Miami-Luken	2,939	1,222	452	88	304	388	5,393
Prescription Supply	0	4	0	1	0	0	5
Rite Aid	n/a	8,235	n/a	n/a	n/a	376	8,611
Walgreens	15,942	28,076	10,431	3,488	44	9,018	66,999
Wal-Mart	2,657	695	729	199	27	622	4,929
<b>Total</b>	<b>214,752</b>	<b>250,120</b>	<b>77,436</b>	<b>24,235</b>	<b>14,130</b>	<b>95,805</b>	<b>676,478</b>

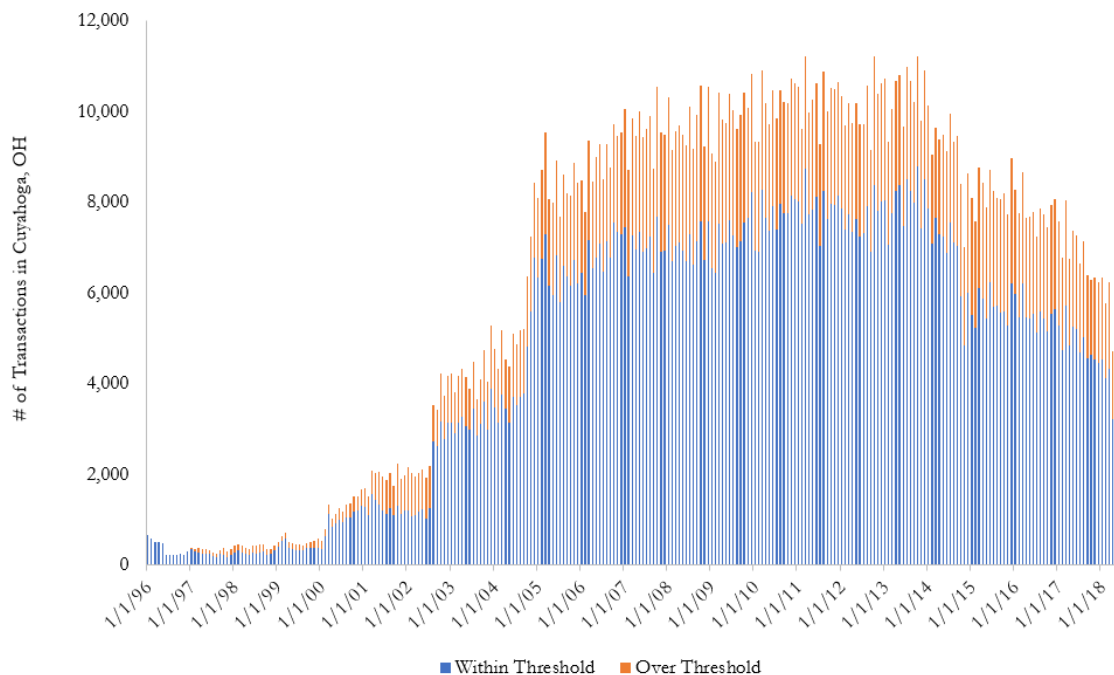
### C. Three Times Trailing Twelve-Month Average Pharmacy Dosage Units

140. I identify transactions that cause the number of dosage units shipped by a Distributor to a Pharmacy in a calendar month to exceed three times the trailing twelve-month average dosage units to retail and chain pharmacies served by the Distributor. I have been asked by Counsel to assume that the Distributor did not effectively investigate the flagged transactions and so every subsequent transaction of that drug code is also flagged because the Distributor had an unfulfilled obligation to detect and investigate the first flagged transaction.



141. Figure 15 illustrates total opioid shipments into Cuyahoga County from 1996 to 2018 from ARCOS Data for 2006 to 2014 and, to the extent I have Defendant transaction data for the periods before 2006 and after 2014. The Three Times Trailing Twelve-Month Average Pharmacy Dosage Units Threshold methodology flags 26.0% of transactions accounting for 32.3% of dosage units, 33.5% of MME and 34.8% of drug weight shipped into Cuyahoga County.

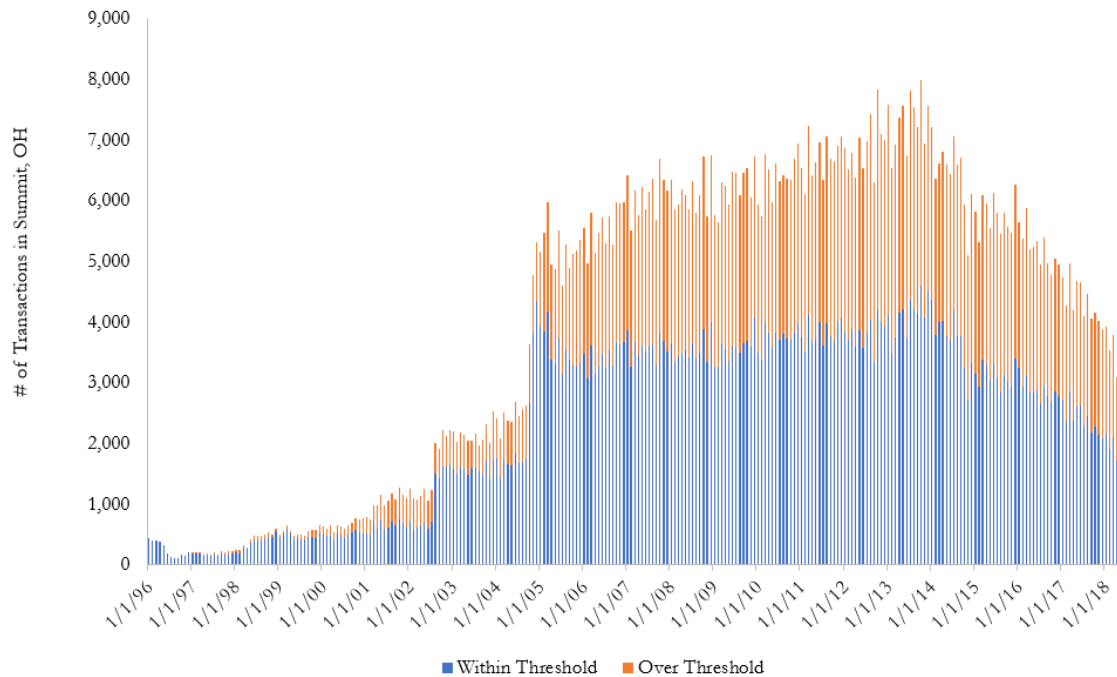
Figure 15 Three Times Trailing Twelve-Month Average Pharmacy Dosage Units Flagged Transactions, Cuyahoga County, OH 1996-2018



142. Figure 16 illustrates total shipments into Summit County from 1996 to 2018 from ARCOS Data for 2006 to 2014 and, to the extent I have Defendant transaction data for the periods before 2006 and after 2014. The Three Times Trailing Twelve-Month Average Pharmacy Dosage Units Threshold methodology flags 40.5% of transactions accounting for 50.0% of

dosage units, 53.3% of MME and 51.4% of drug weight shipped into Summit County.

Figure 16 Three Times Trailing Twelve-Month Average Pharmacy Dosage Units Flagged Transactions, Summit County, OH 1996-2018



143. Table 28 and Table 29 summarize the transactions in transactions flagged based on the Three Times Trailing Twelve-Month Average Pharmacy Dosage Units Threshold in Cuyahoga and Summit Counties.

Table 28 Three Times Trailing Twelve-Month Average Pharmacy Dosage Units Threshold Flagged Transactions, Cuyahoga County, OH 1996-2018

# of Flagged Transactions	Oxycodone	Hydrocodone	Morphine	Hydromorphone	Oxymorphone	Other	Total
AmerisourceBergen	22,663	14,792	3,933	1,319	289	10,561	53,557
Anda, Inc	306	584	3	0	0	182	1,075
Cardinal Health	62,297	67,273	17,572	2,867	4,475	39,223	193,707
CVS	n/a	13,485	n/a	n/a	n/a	2,619	16,104
Discount Drug Mart	n/a	32,445	0	n/a	n/a	1,995	34,440
H. D. Smith	311	0	0	0	0	0	311
HBC Service Co	1,652	2,069	12	34	0	42	3,809
Henry Schein Inc	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McKesson Corp	31,620	41,655	4,172	730	581	13,998	92,756
Miami-Luken	0	0	0	0	n/a	0	0
Prescription Supply	96	468	838	148	1	428	1,979
Rite Aid	n/a	2,631	n/a	n/a	n/a	719	3,350
Walgreens	909	4,490	9,292	3,753	9	11,522	29,975
Wal-Mart	3,239	0	177	69	0	150	3,635
<b>Total</b>	<b>123,093</b>	<b>179,892</b>	<b>35,999</b>	<b>8,920</b>	<b>5,355</b>	<b>81,439</b>	<b>434,698</b>

Table 29 Three Times Trailing Twelve-Month Average Pharmacy Dosage Units Threshold Flagged Transactions, Summit County, OH 1996-2018

# of Flagged Transactions	Oxycodone	Hydrocodone	Morphine	Hydromorphone	Oxymorphone	Other	Total
AmerisourceBergen	26,024	40,096	10,643	4,823	3,051	13,724	98,361
Anda, Inc	981	993	177	21	0	295	2,467
Cardinal Health	49,733	42,267	21,073	6,408	2,295	24,609	146,385
CVS	n/a	17,930	n/a	n/a	n/a	370	18,300
Discount Drug Mart	n/a	7,278	0	n/a	n/a	403	7,681
H. D. Smith	0	91	0	n/a	0	23	114
HBC Service Co	857	8,099	103	0	13	114	9,186
Henry Schein Inc	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McKesson Corp	36,410	48,607	16,642	4,721	4,198	16,232	126,810
Miami-Luken	0	1,111	0	79	243	331	1,764
Prescription Supply	0	4	0	0	0	0	4
Rite Aid	n/a	2,062	n/a	n/a	n/a	129	2,191
Walgreens	0	6,712	6,788	2,491	44	4,516	20,551
Wal-Mart	1,403	0	713	173	0	131	2,420
<b>Total</b>	<b>115,408</b>	<b>175,250</b>	<b>56,139</b>	<b>18,716</b>	<b>9,844</b>	<b>60,877</b>	<b>436,234</b>

#### D. Maximum 8,000 Dosage Units Monthly

144. I identify transactions that cause the number of dosage units shipped by a Distributor to a Pharmacy in a calendar month to exceed 8,000 dosage units. I have been asked by Counsel to assume that the Distributor did not effectively investigate the flagged transactions and so every subsequent transaction of that drug code is also flagged because the Distributor had an unfulfilled obligation to detect and investigate the first flagged transaction.

145. Figure 17 illustrates total opioid shipments into Cuyahoga County from 1996 to 2018 from ARCOS Data for 2006 to 2014 and, to the extent I have Defendant transaction data for the periods before 2006 and after